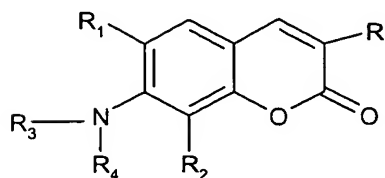


AMENDMENTS TO THE CLAIMS

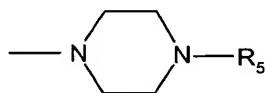
1. (original) A compound of formula I



I

wherein

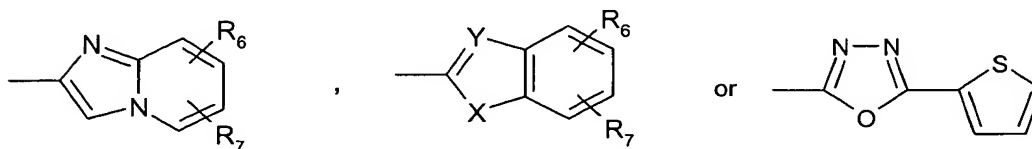
either R_1 and R_2 are both hydrogen and either R_3 and R_4 , independently, are H, CH_3 , $^{11}\text{CH}_3$, $(\text{CH}_2)_n\text{I}$, $(\text{CH}_2)_n^{123}\text{I}$, $(\text{CH}_2)_n\text{OH}$, $(\text{CH}_2)_n\text{F}$ or $(\text{CH}_2)_n^{18}\text{F}$, n being 2, 3 or 4, or R_3 and R_4 , together with the nitrogen atom to which they are attached, form a group of formula



wherein R_5 is H, $(\text{CH}_2)_n\text{I}$, $(\text{CH}_2)_n^{123}\text{I}$, $(\text{CH}_2)_n\text{OH}$, CH_3 , $^{11}\text{CH}_3$, $(\text{CH}_2)_n\text{F}$ or $(\text{CH}_2)_n^{18}\text{F}$, n being as defined above,

or one of R_1 and R_2 is hydrogen and the other, together with R_3 , forms a $-(\text{CH}_2)_m-$ bridge, m being 2 or 3, and R_4 is H, CH_3 , $(\text{CH}_2)_n\text{I}$, $(\text{CH}_2)_n^{123}\text{I}$, $(\text{CH}_2)_n\text{OH}$, $^{11}\text{CH}_3$, $(\text{CH}_2)_n\text{F}$ or $(\text{CH}_2)_n^{18}\text{F}$, and

R is a group of formula

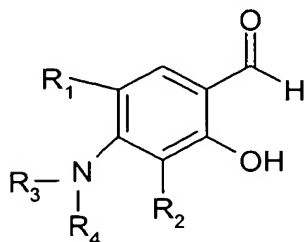


wherein X is O, S or NR_8 , R_8 being H, CH_3 , $^{11}\text{CH}_3$, $(\text{CH}_2)_n\text{I}$, $(\text{CH}_2)_n^{123}\text{I}$, $(\text{CH}_2)_n\text{OH}$, $(\text{CH}_2)_n\text{F}$ or $(\text{CH}_2)_n^{18}\text{F}$ (n being as defined above), Y is CH or N and R_6 and R_7 , independently, are H, NO_2 , F, ^{18}F , $\text{O}(\text{CH}_2)_n\text{F}$, $\text{O}(\text{CH}_2)_n^{18}\text{F}$, Cl, CN, ^{11}CN , OCH_3 , O^{11}CH_3 , I, ^{123}I , $\text{O}(\text{CH}_2)_n\text{I}$ or $\text{O}(\text{CH}_2)_n^{123}\text{I}$ (n being as defined above),

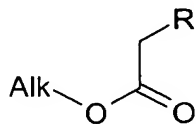
in free base or acid addition salt form, for use as a marker.

2. (original) A process for the production of a compound of formula I as defined in claim 1, or a salt thereof, comprising the step of

- a) for the production of a compound of formula I wherein R_3 , R_4 , R_5 , R_6 , R_7 and R_8 are different from $^{11}\text{CH}_3$, $(\text{CH}_2)_n^{18}\text{F}$, $(\text{CH}_2)_n^{123}\text{I}$, ^{18}F , $\text{O}(\text{CH}_2)_n^{18}\text{F}$, ^{11}CN , O^{11}CH_3 , ^{123}I and $\text{O}(\text{CH}_2)_n^{123}\text{I}$, reacting a compound of formula II with a compound of formula III



II



III

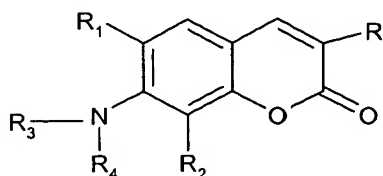
wherein R_3 and R_4 as well as R_5 in R_3 and R_4 ; R_6 and R_7 in R ; and R_8 in X are different from $^{11}\text{CH}_3$, $(\text{CH}_2)_n^{18}\text{F}$, $(\text{CH}_2)_n^{123}\text{I}$, ^{18}F , $\text{O}(\text{CH}_2)_n^{18}\text{F}$, ^{11}CN , O^{11}CH_3 , ^{123}I and $\text{O}(\text{CH}_2)_n^{123}\text{I}$, and Alk is (C_{1-4}) alkyl, or

- b) for the production of a compound of formula I wherein at least one of R_6 and R_7 is O^{11}CH_3 , reacting a compound of formula I wherein at least one of R_6 and R_7 is OH with $^{11}\text{CH}_3$ and a base, or
- c) for the production of a compound of formula I wherein at least one of R_6 and R_7 is $\text{O}(\text{CH}_2)_n^{18}\text{F}$, respectively $\text{O}(\text{CH}_2)_n^{123}\text{I}$, reacting a compound of formula I wherein at least one of R_6 and R_7 is $\text{O}(\text{CH}_2)_n\text{OTs}$ or $\text{O}(\text{CH}_2)_n\text{OMs}$ with $^{18}\text{F}^\ominus$, respectively $^{123}\text{I}^\ominus$, or
- d) for the production of a compound of formula I wherein at least one of R_6 and R_7 is ^{18}F , reacting a compound of formula I wherein at least one of R_6 and R_7 is NO_2 or halogen, with $^{18}\text{F}^\ominus$, or
- e) for the production of a compound of formula I wherein at least one of R_6 and R_7 is ^{123}I , reacting a compound of formula I wherein at least one of R_6 and R_7 is Bu_3Sn , with ^{123}I and hydrogen peroxide, or
- f) for the production of a compound of formula I wherein at least one of R_6 and R_7 is ^{11}CN , reacting a compound of formula I wherein at least one of R_6 and R_7 is OSO_2CF_3 with $[^{11}\text{C}]$ cyanide, or
- g) for the production of a compound of formula I wherein at least one of R_3 , R_4 , R_5 and R_8 is $^{11}\text{CH}_3$, reacting a compound of formula I wherein at least one of R_3 , R_4 , R_5 and R_8 is hydrogen, with $^{11}\text{CH}_3\text{I}$, or

h) for the production of a compound of formula I wherein at least one of R_3 , R_4 , R_5 and R_8 is $(CH_2)_n^{18}F$, respectively $(CH_2)_n^{123}I$, reacting a compound of formula I wherein at least one of R_3 , R_4 , R_5 and R_8 is $(CH_2)_nOTs$ or $(CH_2)_nOMs$ with $^{18}F^-$, respectively I^- ,

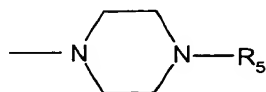
and recovering the resulting compound of formula I in free base form or in form of an acid addition salt.

3. (original) A compound of formula I



wherein

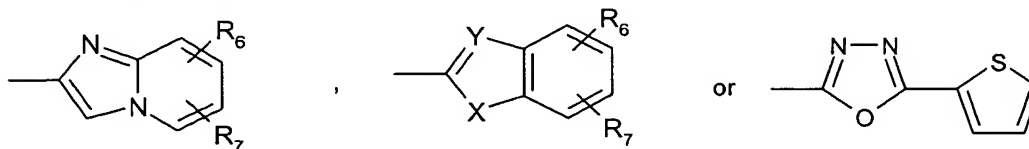
either R_1 and R_2 are both hydrogen and either R_3 and R_4 , independently, are H, CH_3 , $^{11}CH_3$, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, n being 2, 3 or 4, or R_3 and R_4 , together with the nitrogen atom to which they are attached, form a group of formula



wherein R_5 is H, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, CH_3 , $^{11}CH_3$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, n being as defined above,

or one of R_1 and R_2 is hydrogen and the other, together with R_3 , forms a $-(CH_2)_m-$ bridge, m being 2 or 3, and R_4 is H, CH_3 , $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $^{11}CH_3$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$, and

R is a group of formula



wherein X is O, S or NR_8 , R_8 being H, CH_3 , $^{11}CH_3$, $(CH_2)_nI$, $(CH_2)_n^{123}I$, $(CH_2)_nOH$, $(CH_2)_nF$ or $(CH_2)_n^{18}F$ (n being as defined above), Y is CH or N and R_6 and R_7 , independently, are H, NO_2 , F, ^{18}F , $O(CH_2)_nF$, $O(CH_2)_n^{18}F$, Cl, CN, ^{11}CN , OCH_3 , $O^{11}CH_3$, I, ^{123}I , $O(CH_2)_nI$ or $O(CH_2)_n^{123}I$ (n being as defined above),

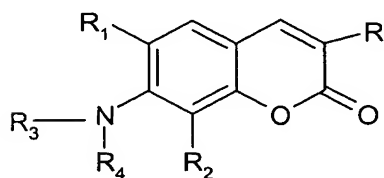
with the exception of

7-Dimethylamino-3-(1-methyl-1H-benzimidazol-2-yl)-chromen-2-one

3-(1H-Benzoimidazol-2-yl)-7-dimethylamino-chromen-2-one
 3-(6-Chloro-benzothiazol-2-yl)-7-dimethylamino-chromen-2-one
 3-Benzothiazol-2-yl-7-dimethylamino-chromen-2-one
 3-Benzooxazol-2-yl-7-dimethylamino-chromen-2-one
 3-Benzooxazol-2-yl-7-methylamino-chromen-2-one
 3-(5-Chloro-benzooxazol-2-yl)-7-dimethylamino-chromen-2-one
 7-Amino-3-(1H-benzoimidazol-2-yl)-chromen-2-one
 3-Benzothiazol-2-yl-7-dimethylamino-6-methyl-chromen-2-one
 7-Dimethylamino-3-(1-ethyl-1H-benzoimidazol-2-yl)-chromen-2-one
 7-Dimethylamino-3-(6-methoxy-benzothiazol-2-yl)-chromen-2-one

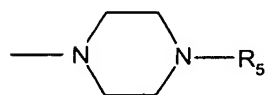
in free base or acid addition salt form.

4. (original) The compound according to claim 3 which is 3-benzothiazol-2-yl-7-[4-(2-fluoro-ethyl)-piperazin-1-yl]-chromen-2-one, in free base or acid addition salt form.
5. (original) A composition for labeling histopathological structures in vitro or in vivo, comprising a compound of formula I



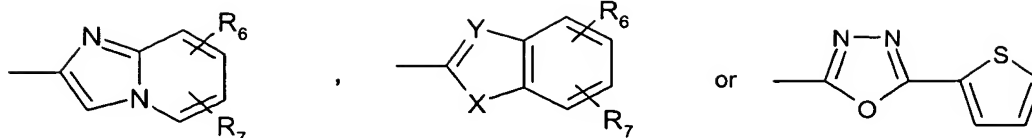
wherein

either R_1 and R_2 are both hydrogen and either R_3 and R_4 , independently, are H, CH_3 , $^{11}\text{CH}_3$, $(\text{CH}_2)_n\text{I}$, $(\text{CH}_2)_n^{123}\text{I}$, $(\text{CH}_2)_n\text{OH}$, $(\text{CH}_2)_n\text{F}$ or $(\text{CH}_2)_n^{18}\text{F}$, n being 2, 3 or 4, or R_3 and R_4 , together with the nitrogen atom to which they are attached, form a group of formula



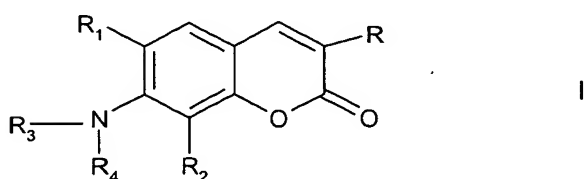
wherein R_5 is H, $(\text{CH}_2)_n\text{I}$, $(\text{CH}_2)_n^{123}\text{I}$, $(\text{CH}_2)_n\text{OH}$, CH_3 , $^{11}\text{CH}_3$, $(\text{CH}_2)_n\text{F}$ or $(\text{CH}_2)_n^{18}\text{F}$, n being as defined above,

or one of R_1 and R_2 is hydrogen and the other, together with R_3 , forms a $-(\text{CH}_2)_m-$ bridge, m being 2 or 3, and R_4 is H, CH_3 , $(\text{CH}_2)_n\text{I}$, $(\text{CH}_2)_n^{123}\text{I}$, $(\text{CH}_2)_n\text{OH}$, $^{11}\text{CH}_3$, $(\text{CH}_2)_n\text{F}$ or $(\text{CH}_2)_n^{18}\text{F}$, and
 R is a group of formula



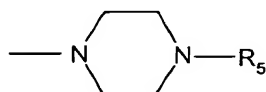
wherein X is O, S or NR₈, R₈ being H, CH₃, ¹¹CH₃, (CH₂)_nI, (CH₂)_n¹²³I, (CH₂)_nOH, (CH₂)_nF or (CH₂)_n¹⁸F (n being as defined above), Y is CH or N and R₆ and R₇, independently, are H, NO₂, F, ¹⁸F, O(CH₂)_nF, O(CH₂)_n¹⁸F, Cl, CN, ¹¹CN, OCH₃, O¹¹CH₃, I, ¹²³I, O(CH₂)_nI or O(CH₂)_n¹²³I (n being as defined above), in free base or acid addition salt form.

6. (original) A method for labeling histopathological structures in vitro or in vivo, comprising contacting brain tissue with a compound of formula I



wherein

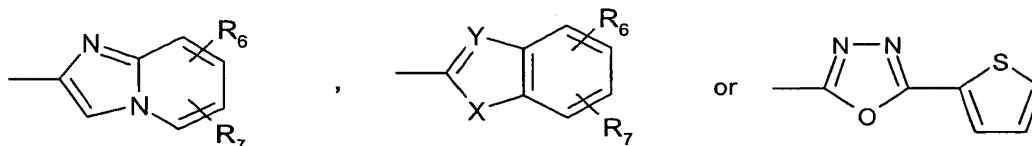
either R₁ and R₂ are both hydrogen and either R₃ and R₄, independently, are H, CH₃, ¹¹CH₃, (CH₂)_nI, (CH₂)_n¹²³I, (CH₂)_nOH, (CH₂)_nF or (CH₂)_n¹⁸F, n being 2, 3 or 4, or R₃ and R₄, together with the nitrogen atom to which they are attached, form a group of formula



wherein R₅ is H, (CH₂)_nI, (CH₂)_n¹²³I, (CH₂)_nOH, CH₃, ¹¹CH₃, (CH₂)_nF or (CH₂)_n¹⁸F, n being as defined above,

or one of R₁ and R₂ is hydrogen and the other, together with R₃, forms a -(CH₂)_m-bridge, m being 2 or 3, and R₄ is H, CH₃, (CH₂)_nI, (CH₂)_n¹²³I, (CH₂)_nOH, ¹¹CH₃, (CH₂)_nF or (CH₂)_n¹⁸F, and

R is a group of formula



wherein X is O, S or NR₈, R₈ being H, CH₃, ¹¹CH₃, (CH₂)_nI, (CH₂)_n¹²³I, (CH₂)_nOH, (CH₂)_nF or (CH₂)_n¹⁸F (n being as defined above), Y is CH or N and R₆ and R₇, independently, are H, NO₂, F, ¹⁸F, O(CH₂)_nF, O(CH₂)_n¹⁸F, Cl, CN, ¹¹CN, OCH₃, O¹¹CH₃, I, ¹²³I, O(CH₂)_nI or O(CH₂)_n¹²³I (n being as defined above),

in free base or acid addition salt form.

7. (original) A method according to claim 6, for labeling β-amyloid plaques and neurofibrillary tangles.
8. (currently amended) A method according to claim 6 or 7, comprising the further step of administering the compound of formula I to a patient.
9. (currently amended) A method according to ~~any of claim[[s]] 6 to 8~~, comprising the further step of determining whether the compound of formula I labeled the target structure.
10. (currently amended) A method according to claim 9, comprising the further step of observing the target structure labeled with a non-radioactive compound of formula I, using fluorescence microscopy.
11. (currently amended) A method according to claim 9, comprising the further step of observing the target structure labeled with a radioactive compound of formula I, using positron emission tomography (PET).
12. (currently amended) A method according to claim 9, comprising the further step of observing the target structure labeled with a radioactive compound of formula I, using single photon emission computed tomography (SPECT).
13. (currently amended) A method according to ~~any one of claim[[s]] 6 to 9, 11 and 12~~, for diagnosing Alzheimer's disease.
14. (original) A method according to claim 13, for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.
15. (currently amended) A method according to ~~any of claim[[s]] 6, 7, 9 and 10~~, for detecting histopathological hallmarks of Alzheimer's disease.
16. (new) A method according to claim 7, comprising the further step of administering the compound of formula I to a patient.

17. (new) A method according to claim 7, comprising the further step of determining whether the compound of formula I labeled the target structure.
18. (new) A method according to claim 17 for diagnosing Alzheimer's disease.
19. (new) A method according to claim 18, for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.
20. (new) A method according to claim 17, comprising the further step of observing the target structure labeled with a non-radioactive compound of formula I, using fluorescence microscopy.
21. (new) A method according to claim 7 for detecting histopathological hallmarks of Alzheimer's disease.
22. (new) A method according to claim 17, comprising the further step of observing the target structure labeled with a radioactive compound of formula I, using positron emission tomography (PET).
23. (new) A method according to claim 22 for diagnosing Alzheimer's disease.
24. (new) A method according to claim 23, for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.
25. (new) A method according to claim 17, comprising the further step of observing the target structure labeled with a radioactive compound of formula I, using single photon emission computed tomography (SPECT).
26. (new) A method according to claim 25 for diagnosing Alzheimer's disease.
27. (new) A method according to claim 26 for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.
28. (new) A method according to claim 25 for diagnosing Alzheimer's disease.
29. (new) A method according to claim 7 for diagnosing Alzheimer's disease.

30. (new) A method according to claim 29 for monitoring the effectiveness of a therapeutic treatment of Alzheimer's disease.
31. (new) A method according to claim 7 for detecting histopathological hallmarks of Alzheimer's disease.